Dart Aerospace Ltd. Friday, 3/9/2007 10:30:23 AM Kim Johnston User: **Process Sheet** : X-TUBE 412 **Drawing Name** Customer : CU-DAR001 Dart Helicopters Services Job Number : 31140 Estimate Number : 12727 : NIA : D412664245 **Part Number** P.O. Number : D412-664-245 YR OIL PUT. S3.09 S.O. No. : MA : 3/9/2007 **Drawing Number** This Issue : NC : NA : N/A Project Number Prsht Rev. : LANDING GEAR : U/R **Drawing Revision** First Issue : 30935 : N/A Previous Run Material : 4/6/2007 **Due Date** 1 Um: Written By Checked & Approved By New Issue 07-02-14 JLM Comment **Additional Product** Job Number: Description: Machine Or Operation: Seq. #: Crosstube Material 1.0 D6009129 Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s) Pick: Qty Part number **Description Batch** 1 D6009-129 Crosstube <u>76508</u> 满贮 Check OD = 3.500"; ID = 2.250" DC DOCUMENT CONTROL 2.0 Comment: DOCUMENT CONTROL Photocopy bluefile & type labels per PPPD412-664-205 3.0 MORI SEIKI MORI SEIKI CNC LATHE LARGE 15 Comment: MORI SEIKI CNC LATHE LARGE

Turn as per Dwg D412-664-245

INSPECT PARTS AS THEY COME OFF MACHINE

Comment: INSPECT PARTS AS THEY COME OFF MACHINE

SECOND CHECK

Comment: SECOND CHECK

Each

Page 1

4.0

5.0

QC2

QC8

W/O:	7			WORK	ORDER CHANGES	· · · · · · · · · · · · · · · · · · ·				
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Part No:		PAR #:	Fault Category:	 NCR: Yes No	DQA:	Date:	
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NCR:		W	ORK OR	DER NON-CONFORMANCI	E (NCR)	1,4 <u>1</u>		
		Description of NC		Corrective Action Section B			Annroyal	Approval
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Verification Section C	Approval Chief Eng	QC Inspector
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Friday, 3/9/2007 10:30:24 AM Date: Kim Johnston User:: **Process Sheet** Drawing Name: X-TUBE 412 Customer: CU-DAR001 Dart Helicopters Services Part Number: D412664245 Job Number: 31140 Job Number: Description: Seq. #: 🧳 Machine Or Operation: LANDING GEAR 1 LANDING GEAR RESOURCE 1 6.0 Comment: LANDING GEAR RESOURCE 1 1-Polish entire outside surface of crosstube 7.0 Comment: INSPECT WORK TO CURRENT STEP -Comment: HAND FINISHING RESOURCE #1 Chemical Conversion Coat as per QSI 005 4.1 INSPECT WORK/WING WALK Comment: Inspect work & Chemical conversion Coat Comment: BENDING MACHINE Bend tube as per Dwg D412-664-243 using CNC bender program 412-af and Folio FT010 DIMENSIONAL CHECK 11.0 103280 \*\* Comment: DIMENSIONAL CHECK 120 D36061 15.0 Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s) **CUFF** Batch: LANDING GEAR RESOURCE 1 LANDING GEAR 1 Comment: LANDING GEAR RESOURCE 1 1-Drill Rivet holes as per Dwg D412-664-245 2-Drill pilot holes in tube as per Dwg D412-664-245 3-Ream hole to finish size in tube as per Dwg D412-664-245

Form: rorocess

Page 2

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W/O:		(A)		V	VORK ORE	ER CHANG	ES				
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Part No	:	PAR #	<b>#:</b>	Fault Ca	tegory:		NCR: Ye	s No DO	QA:	Date: _	
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DATE	STEP	Description of N Section A	IC	Initial Chief Eng	Corrective Actio	Action Section  Description  Chief Eng		n & Sec	ication tion C	Approval Chief Eng	Approval QC Inspector
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	ay, 3/9/2007 10:30:24 AM Johnston	- 0	
•		Process Sheet	·
Customer:	CU-DAR001 Dart Helicopters Se	ervices Drawing Name: X-TUBE 412	
Job Number:	31140	Part Number: D412664245	
. Job Number:			
Seq. #:	Machine Or Operation:	Description :	
	4-Deburr & Inspect for surfa	ace damage. Repair damage within limits as per Dwg D412-664-245	JD7-3-29
17.0	HAND FINISHING1	HAND FINISHING RESOURCE #1	
Comme	ent: HAND FINISHING RESOU Chemical Conversion Coat	Tube & Cuffs as per QSI 005 4.1 RT 07 - 03 . 29	
18:0 18:0	QC3	INSPECT POWDER COAT/CHEMICAL CONVERSION	
Comme	ent: INSPECT POWDER COAT	T/CHEMICAL CONVERSION 27 07 03	
<u> 190</u>		10708 VS	
	ent: INSPECT WORK TO CURP OUTSIDE SERVICE	OUTSIDE SERVICES	
12.0			y y • • •
Comme	ent: Sub-Contracting OUTSIDE Liquid Penetrant Inspection Issue P/O: 3447 LPI a Level 2 Attach copy of NDT	as per QSI 0380r as per ASTM 1417	
13.0	PACKAGING 1	PACKAGING RESOURCE #1	· ·
Comme	Int: PACKAGING RESOURCE Inspect for transit damage Ensure copy of NDT results		10 m
14.0	QC5	INSPECT WORK TO CURRENT STEP	. 7
	nt: Inspect for damage & ensur LANDING GEAR 1	re results are as per Dwg D412-664-203  LANDING GEAR RESOURCE 1	
20.0	LANDING GEAR 1	LANDING GEAR RESOURCE I	
Comme	nt: LANDING GEAR RESOUR	CE 1	
: :		412-6647-245. with Sika flex in Between tube & Cuff 35 07 0	<b>4</b> -07
	A/R SIKAFLEX -241/-291	ВАТСН: <u>M105497</u>	

W/O:		WORK ORDER CHANGES										
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector					
07.53	21	USE CR3212-4-04 RIVETS OTY(22) PER CUFF INSTEAD OF CR3212-4-06 RIVETS				07.01,03						
	·											

Part No:	PAR #:	Fault Category:	NCR: Yes N	lo <b>DQA</b> :	Date:	
			QA: N/0	Closed:	Date:	

NCR:		WORK ORDER NON-CONFORMANCE (NCR)									
	-	Description of NC		Corrective Action Section B		Verification	Approval	Approval			
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Section C	Chief Eng	QC Inspector			
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		-									

Date: Friday, 3/9/2007 10:30:24 AM User:/ · Kim Johnston **Process Sheet** Drawing Name: X-TUBE 412 Customer: CU-DAR001 Dart Helicopters Services Part Number: D412664245 Job Number: 31140 Job Number: Description: Seq. #: Machine Or Operation: SEE WIN CHE CHERRY RIVET 21.0 CR3212406 4.0000 Each(s) Total: Comment: Qtv.: Bt 07-04-03 **CHERRY RIVET** Batch: M1756 9 SPRAY PAINTING 22.0 Comment: SPRAY PAINTING 1-Prime inside and outside crosstube as per QSI 005 4.2 2-Paint outside crosstube with White Imron as per QSI 005 4.2 M QC14 Inspect Spray Paint 23.0 Comment: Inspect Spray Paint 07-04-64 Wrap in plastic bag to protect from scratches D31891 Chafing Shield 24.0 Comment: Qtv.: 2.0000 Each(s) 2.0000 Each(s)/Unit Total: Chafing Shield \_\_\_\_ **3-T 07 04 -05**Rubber Cushion (per sq ft) Batch: 25.0 Comment: Qty.: 0.0536 sf(s)/Unit Total: 0.0536 sf(s)Rubber Cushion Cut to .630" X 5.8" X 2PCS 103 838 D28961 26.0 Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s) Pick: Description Batch
Sunnort 27266 ET 07-04-05 Qty Part number 1 D2896-1

Dart Ae	rospace L	td							
W/O:			W	ORK ORDER CHANG	ES				
DATE	STEP	PRO	CEDURE CH	ANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
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Part No	:	PAR #:	Fault Cat	egory:	NCR: Yes	No <b>DQ</b>	A:	_ Date: _	
					QA: N	I/C Close	d:	_ Date: _	
NCR:		V	ORK ORE	DER NON-CONFORMA	NCE (NCF	₹)			
DATE	0.750	Description of NC	Corrective Action Sec			Verific	cation	Approval	Approval
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Sect	on C	Chief Eng	QC Inspector
							1		

Date: Friday, 3/9/2007 10:30:24 AM Kim Johnston User: ( **Process Sheet** Drawing Name: X-TUBE 412 Customer: CU-DAR001 Dart Helicopters Services Part Number: D412664245 Job Number: 31140 Job Number: Description: Seq. #: Machine Or Operation: Abrasion Strip 27.0 D2856600 0.9450 f(s) Comment: Qty.: 0.9450 f(s)/Unit Abrasion Strip 2 X D2856-600-1009 07.04.07 Batch: MS2192028 4.0000 Each(s) Total: Comment: Qty.: 4.0000 Each(s)/Unit Pick: Qty Part number Description Batch 102534 PT 07-04-05 MS21920-28 Clamp \_\_ clamp(per MIL-DTL-8783C) MS2192032 Comment: Qty.: 2.0000 Each(s) Total: 2.0000 Each(s)/Unit clamp(per MIL-DTL-8783C) batch: 102931 4T 07 04 05 LANDING GEAR RESOURCE 1 Comment: LANDING GEAR RESOURCE 1 Assemble as per Dwg D412-664-245 Install Chaffing Sheilds OG 07-04-04 Instal support with magnobond 6398 per dwg D412-664-245, cure for 12hrs before packaging. Time & date of application: 600 pm 07 04-04 (03628 Batch: QC5 INSPECT WORK TO CURRENT STEP 31.0 Comment: INSPECT WORK TO CURRENT STEP PACKAGING RESOURCE #1 32.0 **PACKAGING** Comment: PACKAGING RESOURCE #1 Identify and pack for shipping as per PPP D412-664-205 BELEASED EFFECTIVE\_

W/O:		WORK ORDER CHANGE	S				
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
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Part No:		PAR #:	Fault Cate	egory:	NCI	R: Yes N	O DQA:	Date: 🔾	Date: <u>87/04/05</u>	
						QA: N/C	Closed:	_ Date: _		
NCR:			WORK ORD	ER NON-CONFO	PRMANCE	(NCR)				
		Description of NC		Corrective Action	Section B		Verification	Annroyal	Approval	
DATE	STEP	Section A	Initial	Action Descrip	otion	Sign &	Section C	Approval Chief Eng	Approval QC Inspector	

DATE	_	TED Description of NC		Corrective Action Section B		Verification	Approval	Approval
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Section C	Approval Chief Eng	QC Inspector
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Date: Friday, 3/9/2007 10:30:24 AM Kim Johnston User:; **Process Sheet** Customer: CU-DAR001 Dart Helicopters Services Drawing Name: X-TUBE 412 Part Number: D412664245 Job Number: 31140 Job Number: Description: Seq. #: 👵 **Machine Or Operation:** \*\*\*\*\*\*Ensure tube is not packaged if curing time is less than 12 hrs, see step 27 for application time & date 12.30 /0 /4/5 Time & date of packaging:\_\_\_ Location:\_ PPP Rev: 33.0 J 07/04/05 Comment: FINAL INSPECTION/W/O RELEASE Job Completion

W/O: WORK ORDER CHANGES		ES					
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
Part No	:	PAR #: Fault Category:	NCR: Yes	No DQ	A:	Date:	
			QA:	N/C Close	d:	_ Date: _	

NCR:		W	ORK OR	DER NON-CONFORMANC	E (NCR)			
		Description of NC		Corrective Action Section B		Verification	Approval	Approval
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Section C	Chief Eng	QC Inspecto
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CHECK	(ED 🚜	APPROVED	DRAWING NO. REV. B
	4	#	D412-664-245 SHEET 1 OF 3
DATE			TITLE SCALE
07.0	3.01	•	CROSSTUBE ASS'Y (412 LOW-N AFT) NTS
Α		06.12.01	NEW ISSUE
В		07.03.01	CHG CUFF AREA, CHG RUBBER CUSHION

# PRELIMINARY ISSUE

#### PARTS LIST:

Qty	Part Number	Description
Х	D412-664-245	CROSSTUBE ASSEMBLY (412 LOW-NARROW AFT)
1	D6009-129	CROSSTUBE
2	D2856-600-1009	ABRASION STRIP
1	D2896-1	SUPPORT
2	D3189-1	CHAFING SHIELD
2	D3595-063-580	RUBBER CUSHION
2	D3606-1	CUFF .
44	CR3212-4-06	RIVET (OR M7885/3-4-06)
4	MS21920-28	CLAMP
2	MS21920-32	CLAMP
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE
	la .	(TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2
	1	ADHESIVE)
A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2
		SEALANT)

#### **GENERAL NOTES:**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6009-129

FINISHED LENGTH = 123.59±0.020 (BEFORE BENDING/TRIMMING)

- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
- PAINT OUTSIDE PER DART 005 4.2
  4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D., EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-600-1009 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-32 CLAMPS WITH D3595-063-580 RUBBER CUSHIONS TO SECURE D289610P COPY SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBERN TO SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB.
- 14) INSTALL D3606-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINTUM(ONAROLLED COP)
  LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT SETEVEFO AMENDMENT
  CUFF AND CROSSTUBE.
- 15) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

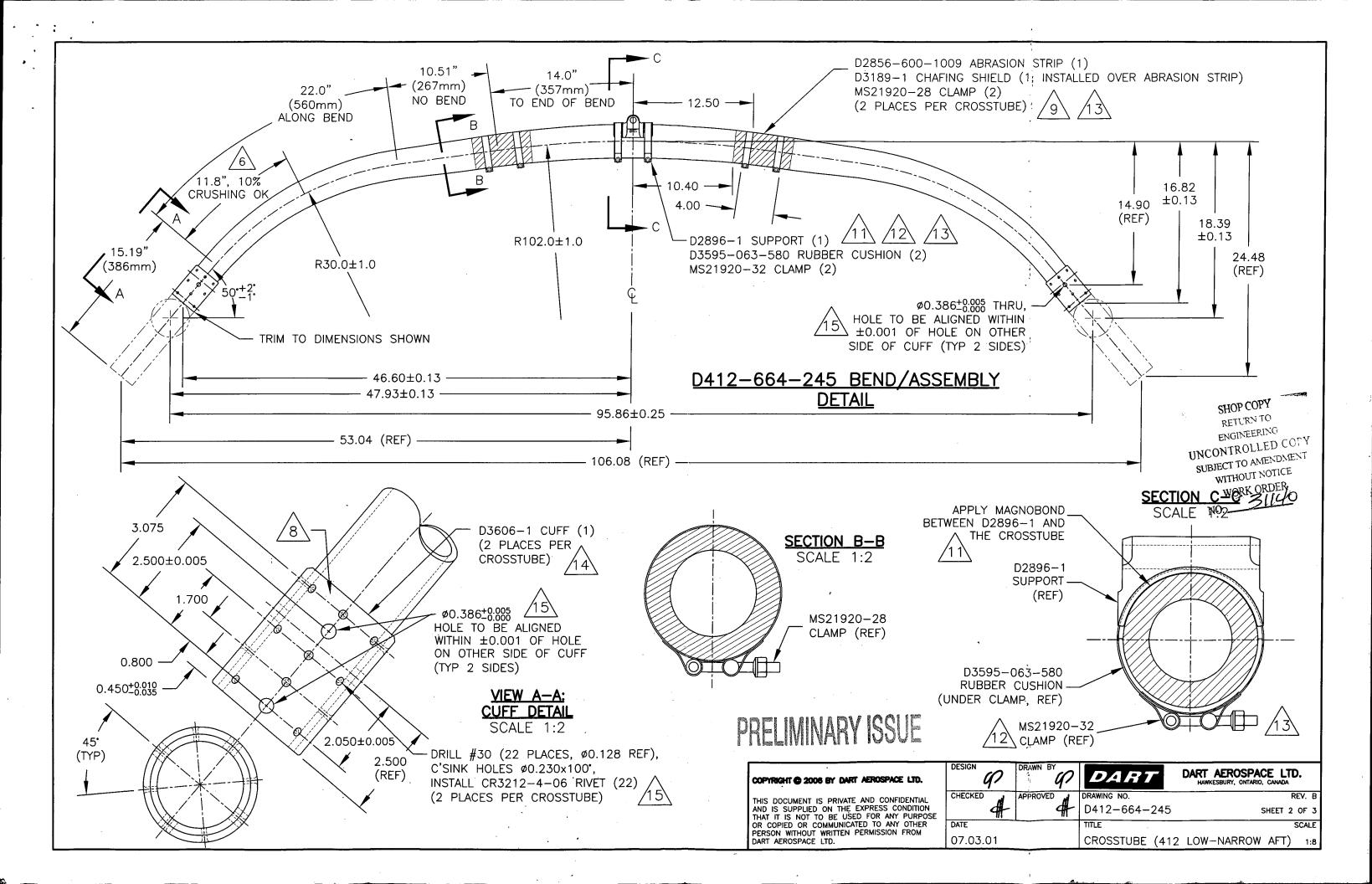
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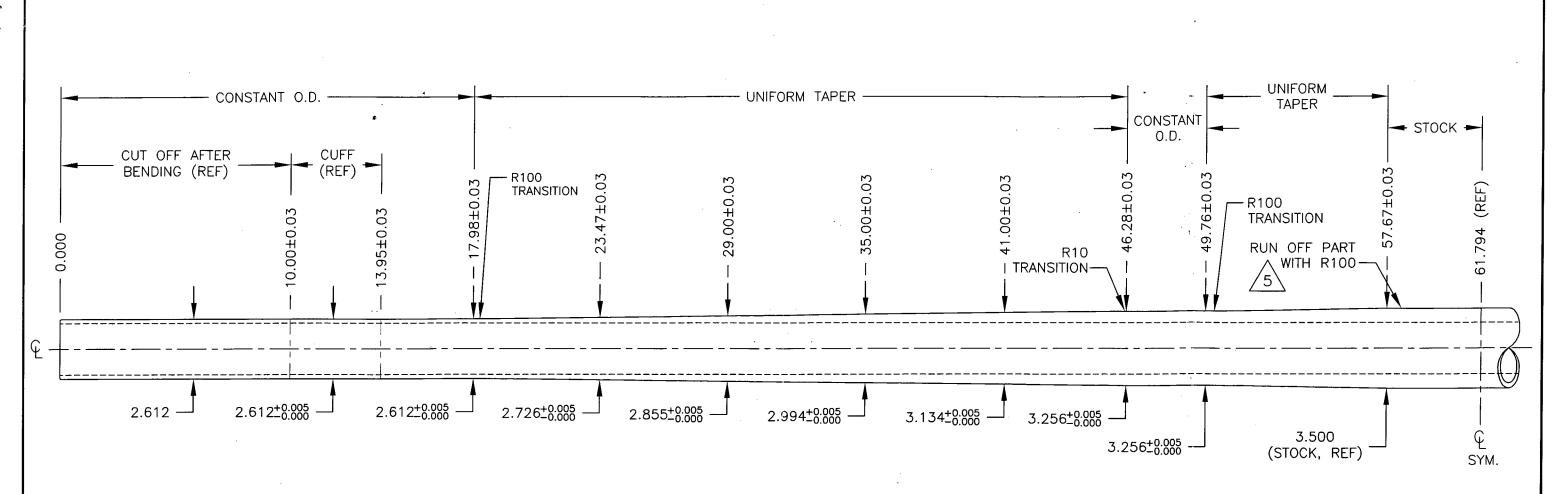
WORK ORDER NO.3114C

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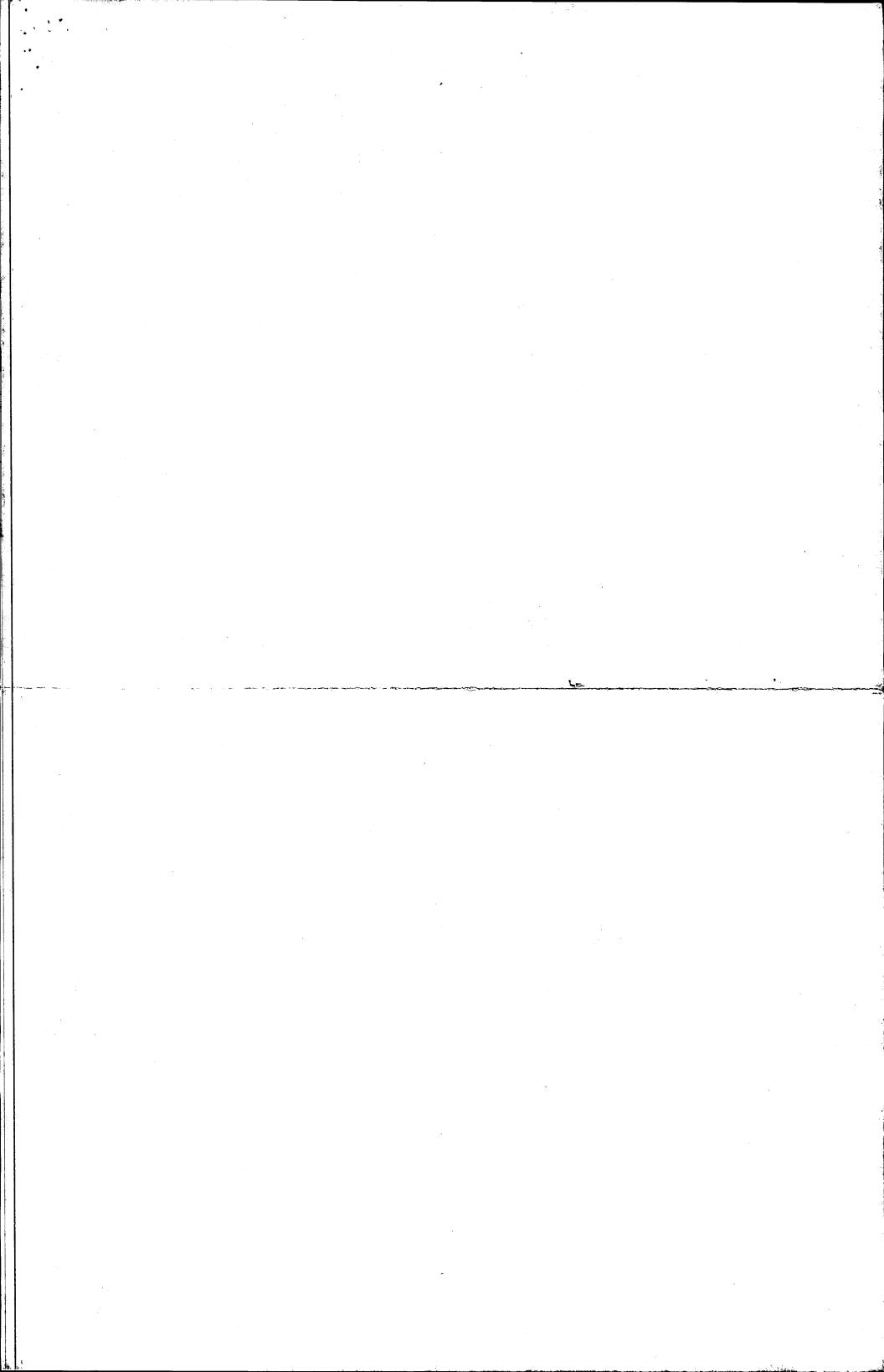


## D412-664-245 MACHINING DETAIL

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SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER

# PRELIMINARY ISSUE

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OR COPIED OR COMMUNICATED TO ANY OTHER	DATE		TITLE	, SCALE
PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	07.03.01		CROSSTUBE (412	2 LOW-NARROW AFT) 1:4



DART AEROSPACE LTD	Work Order:	31140
Description: K. Tuine	Part Number:	Dail 2-66, 1. 2-15
Inspection Dwg: ٥-١/٢٠/٤/١٠- ७٠८ Rev: 3		Page 1 of 1

#### FIRST ARTICLE INSPECTION CHECKLIST

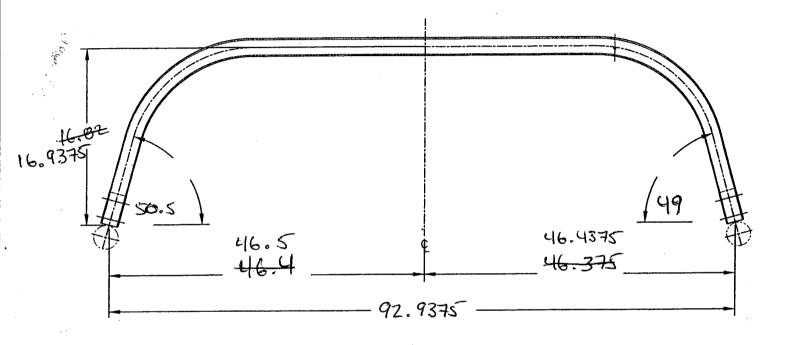
	First Article	Prototype
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	Ins Drav	pection Sheet ving Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
	Α	7.6.2	1.065 ·	2.616	J			
1	В	7-726	5-4	2,728	✓			
	С	7.855	<i>ډ</i> ر	2.856				
	D	7-994	Ċì	2.996	/			
	E	3.134	V ;	2:136	1			
	F	3.256	ેત	3,258	/			
	G	3.500	Shok REE	3,500	<u>/</u>			
	Н	123.588	I-02	123.588				
	1							
	J	7-617	+-005	2.616	<u> </u>			
	K	7-726		2,726	<u> </u>			
	L	7.855	<u> </u>	2.855	<u> </u>			
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Measured by:	2 5	Audited by:	Prototype Approval:	N/A
Date:	07/03/14)	Date: 07/03/15	Date:	N/A
Rev Date	Change		Revised b	y Approved
	Now Ionus		KUDE	1

DART AEROSPACE LTD	Work Order:	31140
Description: Cross Use 412 (Low - Warrow Aft)	Part Number:	D412-664-245
Inspection Dwg: 0412-664-245 Rev: B		Page 1 of 1

Required Dimension	Min	Max
Height	16.69	16.95
1/2 Span	46.47	46.73
Angle	490	52°
Total Span	92.94	93.46



	Comments
uped the height to ma	ax tolerance to make the
tube mere conforming	
1	
dim sheet going to kim fe	- contrated copy.
0 7	
OC15 Increation	

QC15 Inspection	1
Date	07-03-28

Rev	Date	Change	Revised by	Approved
Α		New Issue		1
В	06.09.19	Reformat; QC level revised	KJ/JM	1/2
С	07.02.06	Reformat	KJ/JM	12



**W.0.**  $N^{\circ} = 36071$ 

TOTAL \$

A.M.O. Number: 46/90

## **NON-DESTRUCTIVE TESTING REPORT**

AIRCRAFT / COMPONENT INFORMATION	
•	

	gil der self spiller die Mittel Wester bestellt in			
REGISTRATION:	MODEL/TYPE:		SERIAL NUMBER:	
TOTAL HR/LDG:	OPERATED BY:		BASED AT:	
Oty (2) P/N D20  Qty (2) P/N D41	6) cross tubes (external s file at client) - parts deliv 06-667-203 S/N's B304 12-664-245 S/N's B314	ered to HeathAir.  35 and B30432.		he Dart QSI 038,
RADIOGRAPHY	ULTRASONIC	PENETRANT	MAGNETIC PARTICLE	EDDY CURRENT
cross tubes. Note: A Level 3 Ardrox 97	rant inspection was performed penetrant was substituted OP25E Batch #04B503.  cross tubes inspected. (	d for the requested l	e with the above red Level 2 (3 is more	
THE MAINTE	NANCE DESCRIBED ABOVE HAS BEEN PER THE APPLICABLE STANDARDS OF All	RFORMED IN ACCORDANCE WITH RWORTHINESS	DATE	March 30, 2007
INSPECTE	D BY:	<u> </u>	INSPECT STAMP(:	
CUSTOMER: Dart Aero		OMER INFORMA	P.O. NUI	PO 00003449  Linda Lacelle
LABOUR	@			\$
MATERIALS	@			
TRAVEL EXPENSES	@			GST
HOTEL EXPENSES	@			PST

INVOICE NO.